**Introduction:** Types of languages – Procedural, Functional, Object Oriented

Object-> code + data

**Static vs Dynamic Languages:**

* **Static:** Type check at compile time
  + Errors will show at compile time
  + More control
  + Declare datatype before you use it
* **Dynamic:** Perform type check at runtime
  + Error might not show till program is run
  + No need to declare data type of variables
  + Might give error at compile time

**Introduction to JAVA:**

.java file -> **compile**-> .class file (byte code) -> **Interpreter** (line by line)->M/C code (0,1)

**Byte Code:**

We need JVM to run this code and converted to machine code.

Can run on all operating system.

**Architecture of Java:**

JDK = JRE + Development tools

JRE = JVM + Library Classes

JVM has JIT

**Static:**

Run function without creating object of the class.

**main:**

Entry point of java code

**String[] args:**

Command line arguments, we can pass these arguments from cmd

java Main “Devarshi”

**Change Bytecode Location:**

javac -d . Demo.java

javac -d .. Demo.java

**Package:**

Folder to locate java files

And to provide access

**Primitive Data Types in Java:**

Any data type which cannot be break into any other data type.

Int a = 10;-> 10 is literal , a is an identifier

**Type Casting:**

Float > integer

If asking for integer but giving float will not work but vice versa will work.

Int num = (int)(67.56f); 🡪 type casting 🡪 67

Ex: int a = 257;

byte b = (byte)(a);

b 🡪 1 (max value of byte is 256 so 1 is remainder of maximum value)

**Java follows UNICODE principle**

**Type promotion rules:**

Two types operation will give bigger data type return value

EX:

byte b = 42;

char c = ‘a’;

short s = 1024;

int I = 50000;

float f = 5.67f

double d = 0.1234;

double result = (f\*b) + (i/c) – (d-s);

* Float value 1777.016

**While loop:**

**For loop:**

**[Q1\_LargestNumber.java](https://github.com/Devarshi-tech/DSA_Java/blob/main/Codes/Q1_LargestNumber.java)**

**[Q2\_AlphabetCaseCheck](https://github.com/Devarshi-tech/DSA_Java/blob/main/Codes/Q2_AlphabetCaseCheck.java)**

**[Q3\_FibonacciNumbers](https://github.com/Devarshi-tech/DSA_Java/blob/main/Codes/Q3_FibonacciNumbers.java)**

[**Q4\_CountingOccurrences**](https://github.com/Devarshi-tech/DSA_Java/blob/main/Codes/Q4_CountingOccurrences.java)

Q5\_ReverseOfNumber

Q6\_Calculator

**Switch Statements:**

switch(val){

case val1:

//do something

Break;

Case val2:

// do something

breake;

default:

//do something

}

* If break is not provided code will execute till the end

**Functions/Methods in Java:**

**Scope:**

Accessing variable locally or globally.

Block Scope: variable within a scope

Shadowing: changing global variable value in a block / it will hide global value of that variable

**Variable Arguments(Varargs):**

when to pass n number of arguments.

static void func(int …v){

// …v -> it will internal store in an array

System.out.println(Arrays.toString(v)); 🡪 [1,2,3 . . . etc]

}

static void func(String a, int …v){

// first pass string then pass n number of integers

// order is important

}

**Overloading:**

Two or more functions exists with same name and with different parameters.

[Q7\_PrimeNumber](https://github.com/Devarshi-tech/DSA_Java/blob/main/Codes/Q7_PrimeNumber.java)

[Q8\_ArmStrongNumbers](https://github.com/Devarshi-tech/DSA_Java/blob/main/Codes/Q8_ArmStrongNumbers.java)

**Arrays and Array List:**

Syntax: datatype[] variablName = new datatype[size];

datatype[] variableName = {val1,val2,val3};

collection of same data type.

int[] i = new int[5];

int[] i 🡪 reference variable/ declaration of array (i is getting defined in the stack)(compile time)

new int[5] 🡪 initialisation/ actually here object is being created in heap(run time/ dynamic memory allocation)

# Primitives are stored in stack memory

# Heap objects are not continuous (allocation of array data location in heap is not continuous)

# In java internally array objects may not be continuous -> depends on JVM

# position of array starts from zero

**String Array:**

String[] arr = new String[4];

arr[0] 🡪 null

arr-> store in stack memory

[\_,\_,\_,\_] -> 4 elements stored in heap and this each element itself is an object which has stored in different part of memory

All reference variables by default points to “null”

**Length:**

arr.length

**ForEach Loop:**

for(int num:arr){

// for every element in array, num represents element of array

}

**Print Array:** Arrays.toString(arr);

**2D Arrays:**

Int[][] arr2D = new int[3][];

Length of column is not mandatory

Int[] [] arr2D = {

{},{},{}

}

**Dynamic Arrays:**